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## XII.

# RECENT OBSERVATIONS OF VARIABLE STARS.

### By Edward C. Pickering.

Presented March 12, 1884.

The work of observing variable stars is a branch of astronomical research which can be successfully prosecuted at observatories not provided with the means for undertaking large pieces of routine work. Hence, where these means exist, the observation of variable stars is usually neglected, not from any doubt of its interest or importance, but because it is assumed that attention will be paid to it at institutions less fully equipped, and especially by the numerous amateur observers to whose resources it appears so well adapted.

But in order to obtain the best results in this line of research, some systematic division of the labor has become important. At present, for want of system, some variable stars are observed with unnecessary frequency, while others of no less interest are completely neglected. A bibliography of the variable stars, which is in course of preparation by Mr. S. C. Chandler, Jr., will exhibit large gaps in the observations of many important objects in the list. In such cases, the value of the earlier observations is often impaired by the difficulty of connecting them with those recently made.

In the hope of promoting a more systematic observation of the variable stars, a pamphlet upon the subject, and a subsequent circular, have been issued during the past year by the Harvard College Observatory. In response to the recommendations of the pamphlet, a number of observers signified their inclination to undertake the proposed work, some of whom have already reported many valuable observations. It is to be anticipated that their example will be followed by others, so that the frequent renewal of the special lists of stars required by each participant in the work will become inconvenient. Under these circumstances it seems desirable to make a published statement of the present condition of this branch of scientific inquiry, so that each observer may judge for himself what part of the work can be most profitably undertaken with the means at his disposal. This advantage would obviously be lost by waiting for the reduction and publication of the observations. It is intended to publish another circular early in 1885, giving, so far as practicable, the results obtained during 1884 by all observers of variable stars. The value of this circular will depend upon the amount of assistance which the various astronomers interested in the subject may be inclined to afford. Those who have already undertaken to communicate their observations to this Observatory will, no doubt, continue their co-operation. If the greater part of the results obtained by independent observation elsewhere are also communicated in a form so far condensed that they can be furnished with little trouble to the observers themselves, the proposed circular will exhibit a statement of the course of observation during the year sufficiently complete to form a highly useful guide for subsequent work. It is therefore hoped that observers of variable stars, whether professional astronomers or amateurs, will be generally disposed to furnish the information necessary to the completeness of the circular. This information relates to the following subjects : —

1. Method of observation. If photometric, some account of the instrument and the manner of using it. If not photometric, whether the observations are made by Argelander's method, by the division into tenths of the interval in brightness between two comparison stars, one slightly brighter and the other slightly fainter than the star observed, or by direct estimation of magnitude.

2. Stars observed during 1884, and the number of nights on which each was observed. In naming the stars, it may be convenient to use the numbers given in the first column of Table I. below.

3. The time and form of publication of the observations now contemplated by the observer.

4. Plans for 1885, with regard to the stars selected for observation, and the number of nights on which it is proposed that each shall be observed.

Further information, although not directly required for the purpose of the circular, will be gratefully received. If the observations are not to be published by the observer, a copy of them would be most acceptable. If they are, any results already reached, as, for example, the times and magnitudes of the maxima and minima of the stars, the dates of the separate observations, or the number of nights in each month of the year upon which a given star was observed, would be of much service.

Table I. exhibits the results of observation of variable stars for 1883, so far as they are at hand, in order to show the nature of the

## TABLE I. — Variable Stars.

| No. | H.P. | Name. | R. A. 1875. | | | Dec. 1875. | | Max. | Min. | Per. |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | h. | m. | s. | ° | ′ | m. | m. | d. |
| 0*a* | — | Ceti | 0 | 15 | 26 | −20 | 45.1 | 5.2 | 7.0 | — |
| 1 | 51 | T Cassiopeiæ | | 16 | 29 | +55 | 5.9 | 6.5 — 7.0 | 11 — 11.2 | 436 |
| 2 | 54 | R Andromedæ | | 17 | 28 | +37 | 53.0 | 5.6 — 8.6 | <12.8 | 404.7 |
| 3 | — | S Ceti | | 17 | 42 | −10 | 14.5 | 7.0 — 8.0 | <10.7 | 323.6 |
| 4 | — | B Cassiopeiæ | | 17 | 52 | +63 | 27.2 | >1 | ? | — |
| 5 | — | T Piscium | | 25 | 31 | +13 | 54.6 | 9.5 — 10.2 | 10.5 — 11.0 | Irr. |
| 6 | 94 | α Cassiopeiæ | | 33 | 25 | +55 | 51.1 | 2.2 | 2.8 | Irr. |
| 6*a* | — | U Cephei | | 51 | 18 | +81 | 12.1 | 7.0 | 9.5 | 2.5 |
| 7 | — | S Cassiopeiæ | 1 | 10 | 30 | +71 | 57.2 | 6.7 — 8.5 | <13 | 615 |
| 8 | — | S Piscium | | 11 | 2 | +8 | 16.3 | 8.8 — 9.3 | <13 | 406.6 |
| 8*a* | — | Piscium | | 16 | 22 | +14* | 12.7 | 10 | 14 | — |
| 8*b* | — | Ceti | | 19 | 31 | −4 | 36.6 | 6.5 | 7.8 | — |
| 8*c* | — | R Sculptoris | | 21 | 13 | −33 | 11.5 | 5¾ | 7¾ | 207 |
| 9 | — | R Piscium | | 24 | 12 | +2 | 14.1 | 7.4 — 8.3 | <12.5 | 345 |
| 10 | — | S Arietis | | 57 | 55 | +11 | 55.5 | 9.1 — 9.8 | <13 | 288.8 |
| 11 | — | R Arietis | 2 | 9 | 1 | +24 | 28.4 | 7.6 — 8.5 | 11.9 — 12.7 | 186.2 |
| 12 | 370 | *o* Ceti | | 13 | 1 | −3 | 43.9 | 1.7 — 5.0 | 8 — 9 | 331.3 |
| 13 | — | S Persei | | 13 | 54 | +58 | 0.8 | 8.5 ? | <9.7 | — |
| 14 | — | R Ceti | | 19 | 39 | −0 | 55.7 | 7.9 — 8.7 | <12.8 | 167.1 |
| 15 | — | T Arietis | | 41 | 22 | +16 | 59.3 | 7.9 — 8.2 | 9.4 — 9.7 | 324 |
| 16 | 489 | ρ Persei | | 57 | 10 | +38 | 21.3 | 3.4 | 4.2 | Irr. |
| 17 | 496 | β Persei | 3 | 0 | 2 | +40 | 28.4 | 2.2 | 3.7 | 2.9 |
| 18 | — | R Persei | | 22 | 6 | +35 | 14.3 | 8.1 — 9.2 | 12.5 | 208.8 |
| 19 | 657 | λ Tauri | | 53 | 45 | +12 | 8.2 | 3.4 | 4.2 | 4.0 |
| 20 | — | T Tauri | 4 | 14 | 43 | +19 | 14.3 | 9.2 — 11.5 | 12.8 — < | Irr. |
| 21 | — | R Tauri | | 21 | 27 | +9 | 52.9 | 7.4 — 9.0 | <13 | 325.6 |
| 22 | — | S Tauri | | 22 | 22 | +9 | 40.1 | 9.9 | <13 | 378 |
| 22*a* | — | Doradus | | 35 | 19 | −62 | 19.4 | 5½ | 6¾ | — |
| 23 | — | V Tauri | | 44 | 48 | +17 | 19.6 | 8.3 — 9.0 | <12.8 | 168.6 |
| 24 | — | R Orionis | | 52 | 13 | +7 | 56.3 | 8.7 — 8.9 | <13 | 378.8 |
| 25 | 877 | ε Aurigæ | | 53 | 0 | +43 | 38.2 | 3.0 | 4.5 | Irr. |
| 26 | 880 | R Leporis | | 53 | 55 | −15 | 3.7 | 6 — 7 | 8.5 ? | 437.8 |
| 27 | — | R Aurigæ | 5 | 7 | 12 | +53 | 26.6 | 6.5 — 7.4 | 12.5 — 12.7 | 465 |
| 27*a* | — | S Aurigæ | | 18 | 52 | +34 | 2.3 | 9.4 | <13 | — |
| 28 | — | S Orionis | | 22 | 50 | −4 | 49.9 | 8.3 ? | <12.3 | — |
| 29 | 1005 | δ Orionis | | 25 | 37 | −0 | 25.6 | 2.2 ? | 2.7 | Irr. |
| 29*a* | — | Orionis | | 29 | 42 | −5 | 33.5 | 10 | 13 | — |
| 30 | 1091 | α Orionis | | 48 | 24 | +7 | 23.3 | 1 | 1.4 | Irr. |
| 31 | 1160 | η Geminorum | 6 | 7 | 20 | +22 | 22.4 | 3.2 | 3.7 — 4.2 | 229.1 |
| 31*a* | — | Monocerotis | | 16 | 26 | −2 | 8.1 | 7 | <10 | — |
| 32 | 1205 | T Monocerotis | | 18 | 29 | +7 | 9.1 | 6.2 | 7.6 | 26.8 |
| 33 | — | R Monocerotis | | 32 | 21 | +8 | 50.7 | 9.5 | 11.5 | Irr. |
| 34 | 1256 | S Monocerotis | | 34 | 6 | +10 | 0.5 | 4.9 | 5.4 | 3.4 |
| 35 | — | R Lyncis | | 50 | 59 | +55 | 30.2 | 9 ? | <12.3 | — |
| 36 | 1334 | ζ Geminorum | | 56 | 41 | +20 | 45.1 | 3.7 | 4.5 | 10.2 |
| 37 | — | R Geminorum | | 59 | 49 | +22 | 53.8 | 6.6 — 7.3 | <12.3 | 371.0 |
| 38 | — | R Canis min. | 7 | 1 | 50 | +10 | 13.1 | 7.2 — 7.9 | 9.5 — 10.0 | 335.0 |
| 38*a* | — | Puppis | | 9 | 43 | −44 | 26.2 | 3½ | <6 | 135 |
| 38*b* | — | V Geminorum | | 16 | 10 | +13 | 21.8 | 8.5 | 12 — 13½ | 276 |
| 38*c* | 1417 | U Monocerotis | | 24 | 50 | −9 | 31.0 | 6.0 | 7.2 | 46.0 |
| 39 | — | S Canis min. | | 25 | 56 | +8 | 35.0 | 7.2 — 8.0 | <11 | 332.2 |
| 40 | — | T Canis min. | | 27 | 3 | +12 | 0.6 | 9.1 — 9.7 | <13 | 335.2 |
| 40*a* | — | Canis min. | | 34 | 34 | +8 | 40.2 | 8½ | 13.5 | 405 |

* Declination +12° 12′.7, according to Mr. Parkhurst.

### TABLE I. — Variable Stars.

| No. | Class. | Discoverer. | Date. | Obs. 1883. | Obs. 1880-82. |
|---|---|---|---|---|---|
| 0*a* | — | Chandler | 1881 | 2 C. 36 S. | — |
| 1 | II. | Krüger | 1870 | 14 C. | W. |
| 2 | II. | Argelander | 1858 | 12 C. | Sm. W. |
| 3 | II. | Borelly | 1872 | 6 C. | Sf. W. |
| 4 | I. | Tycho Brahe | 1572 | — | — |
| 5 | II. | Luther | 1855 | 6 C. | — |
| 6 | III. | Birt | 1831 | — | Sm. W. |
| 6*a* | V. | Ceraski | 1880 | — | Sm. W. |
| 7 | II. | Argelander | 1861 | 15 C. 26 P. 8 S. | Sf. Sm. W. |
| 8 | II. | Hind | 1851 | 7 C. | Sm. |
| 8*a* | — | Peters | 1880 | — | — |
| 8*b* | — | Gould | 1874? | — | — |
| 8*c* | II. | Gould | 1872? | — | — |
| 9 | II. | Hind | 1850 | 9 C. | Sm. W. |
| 10 | II. | Peters | 1865 | 6 C. | — |
| 11 | II. | Argelander | 1857 | 7 C. 19 H. 1 Z. | Sm. W. |
| 12 | II. | Fabricius | 1596 | 5 C. | Sm. |
| 13 | II. | Krüger | 1873 | 13 C. 17 H. | Sf. |
| 14 | II. | Argelander | 1866 | 4 C. | — |
| 15 | II. | Auwers | 1870 | 10 C. 24 H. 7 Z. | — |
| 16 | II.? | Schmidt | 1854 | 35 S. | Sm. |
| 17 | V. | Montanari | 1669 | — | Müller, Sm. W. |
| 18 | II. | Schönfeld | 1861 | 7 C. 6 H. | H. Sm. W. |
| 19 | V. | Baxendell | 1848 | — | — |
| 20 | — | Hind | 1861 | 7 C. | — |
| 21 | II. | Hind | 1849 | 10 C. | Sf. Sm. W. |
| 22 | II. | Oudemans | 1855 | 10 C. | Sf. W. |
| 22*a* | — | Gould | 1874? | 7 L. 9 U. | — |
| 23 | II. | Auwers | 1871 | 13 C. 6 P. | H. Sf. W. |
| 24 | II. | Hind | 1848 | 11 C. | H. Sf. W. |
| 25 | III. | Fritsch | 1821 | 10 S. | Sm. |
| 26 | II. | Schmidt | 1855 | 7 C. 22 S. | Sm. |
| 27 | II. | At Bonn | 1862 | 9 C. 26 H. | Sf. Sm. |
| 27*a* | II. | Dunér | 1881 | 10 C. 8 P. | D. Sm. |
| 28 | II. | Webb | 1870 | 10 C. | Sf. |
| 29 | III. | J. Herschel | 1834 | 8 S. | — |
| 29*a* | — | Bond | 1863 | 6 C. | Müller |
| 30 | III. | J. Herschel | 1836 | — | Sm. |
| 31 | II.? | Schmidt | 1866 | — | Sm. |
| 31*a* | — | Schönfeld | 1883 | 2 C. | — |
| 32 | IV. | Gould | 1871 | 61 S. | W. |
| 33 | II. | Schmidt | 1861 | 11 C. | Sm. |
| 34 | IV. | Winnecke | 1867 | 8 S. | — |
| 35 | II. | Krüger | 1874 | 12 C. 14 P. | H. |
| 36 | IV. | Schmidt | 1844 | — | Sm. |
| 37 | II. | Hind | 1848 | 14 C. 19 P. 26 S. | W. |
| 38 | II. | At Bonn | 1854 | 16 C. 3 H. 3 Z. | Sf. W. |
| 38*a* | II. | Gould | 1872 | 10 L. 12 U. | — |
| 38*b* | II. | Baxendell | 1880 | 17 C. | Baxendell |
| 38*c* | II.? | Gould | 1873 | 36 S. | — |
| 39 | II. | Hind | 1856 | 14 C. | Sf. W. |
| 40 | II. | Schönfeld | 1865 | 9 C. | — |
| 40*a* | II. | Baxendell | 1879 | 9 C. | Sm. |

TABLE I. — *Continued.*

| No. | H.P. | Name. | R. A. 1875. | | | Dec. 1875. | | Max. | Min. | Per. |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | h. | m. | s. | ° | ′ | m. | m. | d. |
| 41 | — | S Geminorum | 7 | 35 | 32 | +23 | 44.6 | 8.2 — 8.7 | <13 | 294.2 |
| 42 | — | T Geminorum | | 41 | 48 | +24 | 2.7 | 8.1 — 8.7 | <13 | 288.1 |
| 42*a* | — | S Puppis | | 43 | 6 | —47 | 8.3 | 7¼ | 9 | — |
| 43 | — | U Geminorum | | 47 | 41 | +22 | 19.7 | 8.9 — 9.7 | 13.1 | Irr. |
| 43*a* | — | Puppis | | 55 | 0 | —12 | 32 | 8½ | <14 | 310 |
| 44 | — | R Cancri | 8 | 9 | 40 | +12 | 6.5 | 6.2 — 8.3 | <11.7 | 354.4 |
| 45 | — | V Cancri | | 14 | 36 | +17 | 40.9 | 6.8 — 7.2 | <12 | 272 |
| 46 | — | U Cancri | | 28 | 37 | +19 | 19.5 | 8.2 — 10.4 | <13 | 305.7 |
| 47 | — | S Cancri | | 36 | 48 | +19 | 29.0 | 8.2 | 9.8 | 9.5 |
| 48 | — | S Hydræ | | 47 | 3 | + 3 | 32.4 | 7.5 — 8.5 | <12.2 | 256.4 |
| 49 | — | T Cancri | | 49 | 32 | +20 | 19.7 | 8.2 — 8.5 | 9.3 — 10.5 | 484.2 |
| 50 | — | T Hydræ | | 49 | 35 | — 8 | 31.0 | 7.0 — 8.1 | <12.5 | 289.4 |
| 50*a* | — | R Carinæ | 9 | 29 | 6 | —62 | 14.2 | 4.4 | 9.3 | 313 |
| 51 | — | R Leonis min. | | 38 | 4 | +35 | 5.2 | 6.1 — 7.5 | <11.0 | 374.7 |
| 52 | 1752 | R Leonis | | 40 | 50 | +12 | 0.5 | 5.2 — 6.4 | 9.4 — 10.0 | 312.6 |
| 52*a* | — | l Carinæ | | 41 | 49 | —61 | 55.9 | 3.7 | 5.2 | 31.2 |
| 52*b* | — | Leonis | | 53 | 3 | +21 | 51.6 | 8½ | 8.6<13 | 280 ? |
| 52*c* | — | Antliæ | 10 | 4 | 22 | —37 | 7.1 | 6½ | <8 | — |
| 52*d* | — | Carinæ | | 5 | 23 | —60 | 56.3 | 6¼ | 9 | — |
| 52*e* | — | U Leonis | | 17 | 21 | +14 | 38.1 | 9½ | Inv. | — |
| 52*f* | 1869 | Hydræ | | 31 | 22 | —12 | 44.1 | 4½ | 6 | — |
| 53 | 1880 | R Ursæ maj. | | 35 | 47 | +69 | 25.9 | 6.0 — 8.1 | 12 | 303.4 |
| 54 | — | η Argus | | 40 | 13 | —58 | 49.2 | >1 | 6.3 | Irr. |
| 54*a* | — | T Carinæ | | 50 | 18 | —59 | 51.2 | 6.2 | 6.9 | — |
| 55 | — | R Crateris | | 54 | 25 | —17 | 26.4 | >8 | <9 | — |
| 56 | — | S Leonis | 11 | 4 | 23 | + 6 | 8.5 | 9.0 — 9.7 | <13 | 187.6 |
| 57 | — | T Leonis | | 32 | 2 | + 4 | 3.9 | 10 ? | <13 | — |
| 58 | — | X Virginis | | 55 | 27 | + 9 | 46.1 | 7.8 ? | <10 | — |
| 59 | — | R Comæ | | 57 | 51 | +19 | 28.8 | 7.4 — 8.0 | <13 | 363 |
| 60 | — | T Virginis | 12 | 8 | 12 | — 5 | 7.2 | 8.0 — 8.8 | <13 | 337 |
| 61 | — | R Corvi | | 13 | 10 | —18 | 20.3 | 6.8 — 7.3 | <11.5 | 318.6 |
| 61*a* | — | — Virginis | | 27 | 26 | — 3 | 43.8 | 8 | 14 | 210± |
| 62 | — | T Ursæ maj. | | 30 | 42 | +60 | 10.6 | 7.0 — 8.3 | 12.2 | 255.6 |
| 63 | 2147 | R Virginis | | 32 | 10 | + 7 | 40.6 | 6.5 — 7.5 | 10.0 — 10.9 | 145.7 |
| 63*a* | — | R Muscæ | | 34 | 28 | —68 | 43.3 | 6.6 | 7.3 | 0.9 |
| 64 | — | S Ursæ maj. | | 38 | 28 | +61 | 46.7 | 7.7 — 8.2 | 10.2 — 11.1 | 224.8 |
| 65 | — | U Virginis | | 44 | 46 | + 6 | 14.0 | 7.7 — 8.1 | 12.2 — 12.8 | 207.4 |
| 66 | — | W Virginis | 13 | 19 | 35 | — 2 | 31.2 | 8.7 — 9.2 | 9.8 — 10.4 | 17.3 |
| 67 | — | V Virginis | | 21 | 21 | — 2 | 19.0 | 8.0 — 9.0 | <13 | 251 |
| 68 | 2275 | R Hydræ | | 22 | 53 | —22 | 25.6 | 4.0 — 5.5 | 10 ? | 469.3 |
| 69 | 2289 | S Virginis | | 26 | 29 | — 6 | 20.6 | 5.7 — 7.8 | 12.5 | 374.0 |
| 69*a* | — | Virginis | 14 | 3 | 37 | —12 | 42.7 | 9 | 14 | — |
| 69*b* | — | R Centauri | | 7 | 35 | —59 | 19.8 | 6 | 10 | — |
| 70 | — | T Bootis | | 8 | 14 | +19 | 39.1 | 9.7 ? | <13 | — |
| 71 | — | S Bootis | | 18 | 41 | +54 | 22.7 | 8.1 — 8.5 | 13.2 | 272.4 |
| 72 | — | R Camelopardi | | 27 | 8 | +84 | 23.8 | 7.9 — 8.6 | 12 ? | 266.2 |
| 73 | 2445 | R Bootis | | 31 | 41 | +27 | 16.9 | 5.9 — 7.5 | 11.3 — 12.2 | 223.0 |
| 73*a* | 2459 | Bootis | | 37 | 56 | +27 | 3.6 | 5.2 | 6.1 | 370 ? |
| 73*b* | — | Bootis | | 48 | 33 | +18 | 12.1 | 9.1 | 12.0 — 13.6 | 173.8 |
| 74 | 2506 | δ Libræ | | 54 | 18 | — 7 | 51.6 | 4.9 | 6.1 | 2.3 |
| 74*a* | — | Libræ | 15 | 3 | 37 | —19 | 33.9 | 10 | <13.5 | 700± |
| 74*b* | — | R Triang. Austr. | | 8 | 37 | —66 | 2.1 | 6.6 | 8.0 | 3.4 |
| 75 | — | U Coronæ | | 13 | 6 | +32 | 6.4 | 7.6 | 8.8 | 3.5 |
| 76 | — | S Libræ | | 14 | 13 | —19 | 47.3 | 8.0 | 12.5 ? | — |
| 77 | — | S Serpentis | | 15 | 48 | +14 | 45.9 | 7.6 — 8.6 | 12.5 ? | 361.0 |

TABLE I. — *Continued.*

| No. | Class. | Discoverer. | Date. | Obs. 1883. | Obs. 1880-82. |
|---|---|---|---|---|---|
| 41 | II. | Hind | 1848 | 6 C. | Sf. W. |
| 42 | II. | Hind | 1848 | 7 C. | Sf. W. |
| 42*a* | — | Gould | 1874? | — | — |
| 43 | II.? | Hind | 1855 | 24 C. | H. Sf. |
| 43*a* | II. | Pickering | 1881 | 12 C. | — |
| 44 | II. | Schmidt | 1829 | 13 C. | Sm. W. |
| 45 | II. | Auwers | 1870 | 15 C. 13 P. 21 S. | Sm. W. |
| 46 | II. | Chacornac | 1853 | 11 C. | Sm. |
| 47 | V. | Hind | 1848 | — | Sm. |
| 48 | II. | Hind | 1848 | 12 C. | D. Sf. |
| 49 | II. | Hind | 1850 | 14 C. 14 P. | — |
| 50 | II. | Hind | 1851 | 11 C. | Sf. W. |
| 50*a* | II. | Gould | 1871 | — | — |
| 51 | II. | Schönfeld | 1863 | 10 C. 22 S. | Sm. |
| 52 | II. | Koch | 1782 | 12 C. 14 S. | D. Sf. Sm. |
| 52*a* | — | Gould | 1871 | 16 L. 17 U. | — |
| 52*b* | II. | Becker | 1882 | 8 C. | Becker |
| 52*c* | — | Gould | 1872 | — | — |
| 52*d* | — | Gould | 1871 | — | — |
| 52*e* | — | Peters | 1876 | 7 C. | — |
| 52*f* | — | Gould | 1871 | — | — |
| 53 | II. | Pogson | 1853 | 14 C. 31 H. 23 S. 7 Z. | Sm. W. |
| 54 | II.? | Burchell | 1827 | — | — |
| 54*a* | — | Thome | 1872 | 10 L. 11 U. | — |
| 55 | II. | Winnecke | 1861 | 10 C. | Sf. |
| 56 | II. | Chacornac | 1856 | 13 C. | — |
| 57 | II. | Peters | 1865 | 4 C. | — |
| 58 | II. | Peters | 1871 | 9 C. | — |
| 59 | II. | Schönfeld | 1856 | 8 C. 30 P. | — |
| 60 | II. | Boguslawski | 1849 | 5 C. | — |
| 61 | II. | Karlinski | 1867 | 9 C. | Sf. |
| 61*a* | II. | Henry | — | 11 C. | — |
| 62 | II. | Hencke | 1856 | 17 C. 39 S. | H. Sf. Sm. W. |
| 63 | II. | Harding | 1809 | 17 C. 26 S. | H. Sm. W. |
| 63*a* | IV. | Gould | 1871 | 10 L. 16 U. | — |
| 64 | II. | Pogson | 1853 | 17 C. 35 S. | D. Sf. Sm. W. |
| 65 | II. | Harding | 1831 | 14 C. | D. Sm. W. |
| 66 | II.? | Schönfeld | 1866 | 12 C. | D. |
| 67 | II. | Goldschmidt | 1857 | 10 C. 22 P. | W. |
| 68 | II. | Miraldi | 1704 | 2 C. 41 S. | D. Sm. T. |
| 69 | II. | Hind | 1852 | 12 C. | — |
| 69*a* | II. | Palisa | 1880 | 7 C. | — |
| 69*b* | — | Gould | 1871 | 9 L. 11 U. | — |
| 70 | I.? | Baxendell | 1860 | — | — |
| 71 | II. | At Bonn | 1860 | 15 C. | D. Sm. |
| 72 | II. | Hencke | 1858 | 7 C. | Sf. Sm. |
| 73 | II. | At Bonn | 1858 | 15 C. 32 S. | Sm. W. |
| 73*a* | — | Schmidt | 1867 | — | — |
| 73*b* | II. | Baxendell | 1880 | 11 C. | Baxendell |
| 74 | V. | Schmidt | 1859 | — | Sm. |
| 74*a* | II. | Palisa | 1878 | 5 C. | Palisa, Weis |
| 74*b* | IV.? | Gould | 1871 | 2 L. 6 U. | — |
| 75 | V. | Winnecke | 1869 | — | Sm. |
| 76 | II. | Borelly | 1872 | 6 C. | Sf. |
| 77 | II. | Harding | 1828 | 6 C. | D. |

TABLE I. — *Continued.*

| No. | H.P. | Name. | R. A. 1875. | Dec. 1875. | Max. | Min. | Per. |
|---|---|---|---|---|---|---|---|
| | | | h. m. s. | ° ′ | m. | m. | d. |
| 78 | 2553 | S Coronæ | 15 16 18 | +31 49.1 | 6.1 — 7.8 | 11.9 — 12.5 | 361.0 |
| 78*a* | — | Libræ | 34 46 | —20 46.5 | 9 | <14 | — |
| 79 | 2639 | R Coronæ | 43 25 | +28 32.5 | 5.8 | 13.0 | Irr. |
| 80 | 2647 | R Serpentis | 44 56 | +15 30.8 | 5.6 — 7.6 | <11 | 357.6 |
| 80*a* | — | V Coronæ | 45 4 | +39 57.0 | 7.7 | 12 | 360.0 |
| 81 | — | R Libræ | 46 32 | —15 44.5 | 9.2 — 10.0 | <13 | 723 |
| 82 | 2678 | T Coronæ | 54 16 | +26 16.5 | 2.0 | 9.5 | — |
| 83 | — | R Herculis | 16 0 37 | +18 42.5 | 8.0 — 9.0 | <13 | 319.0 |
| 83*a* | — | W Scorpii | 4 28 | —19 48.6 | 10 | <13 | 224.3 |
| 84 | — | T Scorpii | 9 36 | —22 33.5 | 7 | <10 | — |
| 85 | — | R Scorpii | 10 12 | —22 31.8 | 9 ? — 10.5 | <12.5 | 223 |
| 86 | — | S Scorpii | 10 13 | —22 28.8 | 9.1 — 10.5 | <12.5 | 176.9 |
| 86*a* | — | Ophiuchi | 14 40 | — 7 24.0 | 9.0 | <13.5 | 326 |
| 87 | — | U Scorpii | 15 16 | —17 29.3 | 9 ? | <12 | — |
| 87*a* | — | Ophiuchi | 19 46 | —12 8.5 | 7.5 | 10.5 | 365 |
| 88 | — | U Herculis | 20 16 | +19 10.8 | 6.6 — 7.7 | 11.4 — 11.6 | 408.3 |
| 89 | 2772 | g Herculis | 24 32 | +42 9.6 | 5 | 6.2 | Irr. |
| 90 | — | T Ophiuchi | 26 35 | —15 46.6 | 10 | <12.5 | — |
| 91 | — | S Ophiuchi | 27 4 | —16 48.5 | 8.3 — 9.0 | <12.5 | 233.8 |
| 91*a* | — | W Herculis | 30 48 | +37 35.6 | 8.0 | <14.5 | 289 |
| 91*b* | — | Urs. Min. | 31 40 | +72 31.9 | 8.6 | 10.5 | 180 ? |
| 91*c* | — | R Draconis | 32 22 | +67 0.7 | 7.2 | 13< | 245.9 |
| 92 | 2828 | S Herculis | 46 13 | +15 9.2 | 5.9 — 6.8 | 11.5 — 12.2 | 303 |
| 93 | 2839 | Ophiuchi | 52 30 | —12 38.0 | 5.5 | 12.5 | — |
| 93*a* | — | V Herculis | 53 41 | +35 15.5 | 9.0 | 11.7 | — |
| 94 | — | R Ophiuchi | 17 0 36 | —15 51.9 | 7.6 — 8.1 | <12 | 302.4 |
| 95 | 2879 | α Herculis | 8 57 | +14 32.1 | 3.1 | 3.9 | Irr. |
| 95*a* | 2883 | U Ophiuchi | 10 12 | + 1 21.0 | 6.1 | 6.8 | 0.9 |
| 96 | 2890 | u Herculis | 12 42 | +33 14.1 | 4.6 | 5.4 | 38.5 |
| 97 | — | Serpentarii | 23 9 | —21 20.0 | >1 | ? | — |
| 98 | 2972 | X Sagittarii | 39 41 | —27 45.6 | 4 | 6 | 7.0 |
| 99 | 3035 | W Sagittarii | 57 2 | —29 34.7 | 5 | 6.5 | 7.6 |
| 100 | — | T Herculis | 18 4 22 | +31 0.1 | 7.2 — 8.3 | 11.4 — 12.1 | 165.1 |
| 101 | — | T Serpentis | 22 43 | + 6 13.1 | 9.1 — 10.0 | <12.8 | 342.3 |
| 102 | — | V Sagittarii | 24 4 | —18 22.1 | 7.5 ? | 9.5 ? | — |
| 103 | — | U Sagittarii | 24 32 | —19 13.9 | 7.0 | 8.3 | 6.7 |
| 104 | — | T Aquilæ | 39 45 | + 8 36.9 | 8.8 | 9.5 | Irr. |
| 105 | 3176 | R Scuti | 40 49 | — 5 52.6 | 4.7 — 5.7 | 6.0 — 8.5 | 71.1 |
| 105*a* | — | κ Pavonis | 44 3 | —67 23.2 | 4.0 | 5.5 | 9.1 |
| 106 | 3193 | β Lyræ | 45 28 | +33 13.0 | 3.4 | 4.5 | 12.9 |
| 107 | 3224 | R Lyræ | 51 32 | +43 47.1 | 4.3 | 4.6 | 46.0 |
| 108 | — | S Coron. Austr. | 52 43 | —37 10.0 | 9.8 | 11.5 ? | 6.1 |
| 109 | — | R Coron. Austr. | 53 29 | —37 10.4 | 10.5 — 11.5 | <12.5 | 31 |
| 110 | — | R Aquilæ | 19 0 21 | + 8 2.6 | 6.4 — 7.4 | 10.9 — 11.2 | 345.1 |
| 111 | — | T Sagittarii | 9 1 | —17 15.2 | 7.6 — 8.1 | <11 | 381 |
| 112 | — | R Sagittarii | 9 21 | —19 35.5 | 7.0 — 7.2 | <12 | 270.0 |
| 113 | — | S Sagittarii | 12 7 | —19 19.1 | 9.7 — 10.4 | <12.7 | 230 |
| 114 | 3395 | R Cygni | 33 28 | +49 55.1 | 5.9 — 8.0 | 13 | 425.3 |
| 115 | — | 11 Vulpeculæ | 42 26 | +27 0.5 | 3 | ? | — |
| 116 | — | S Vulpeculæ | 43 16 | +26 58.7 | 8.4 — 8.9 | 9.0 — 9.5 | 67.5 |
| 117 | 3434 | χ Cygni | 45 46 | +32 36.0 | 4.0 — 6.0 | 12.8 | 406.5 |
| 118 | 3436 | η Aquilæ | 46 6 | + 0 41.2 | 3.5 | 4.7 | 7.2 |
| 119 | — | S Cygni | 20 2 53 | +57 37.6 | 8.8 — 9.5 | <13 | 322.8 |
| 120 | — | R Capricorni | 4 17 | —14 45.0 | 8.8 — 9.7 | <13 | 347 |
| 121 | — | S Aquilæ | 5 52 | +15 14.9 | 8.9 — 9.9 | 10.7 — 11.8 | 147.2 |

TABLE I. — *Continued.*

| No. | Class. | Discoverer. | Date. | Obs. 1883. | Obs. 1880-82. |
|---|---|---|---|---|---|
| 78 | II. | Hencke | 1860 | 13 C. 43 S. | H. Sm. W. |
| 78*a* | — | Peters | 1878 | — | — |
| 79 | II.? | Pigott | 1795 | 14 C. 56 S. | Sm. W. |
| 80 | II. | Harding | 1826 | 10 C. | Sm. |
| 80*a* | II. | Dunér | 1878 | 13 C. | H. Sf. Sm. W. |
| 81 | II. | Pogson | 1858 | 2 C. | — |
| 82 | I. | Birmingham | 1866 | — | Sm. |
| 83 | II. | At Bonn | 1855 | 12 C. 4 H. | H. Sm. |
| 83*a* | II. | J. Palisa | 1877 | 3 C. | Sm. |
| 84 | I. | Auwers | 1860 | 2 C. | — |
| 85 | II. | Chacornac | 1853 | 7 C. | Sm. |
| 86 | II. | Chacornac | 1854 | 6 C. | Sm. |
| 86*a* | II. | Schöneld | 1881 | 8 C. | Sm. |
| 87 | I.? | Pogson | 1863 | — | — |
| 87*a* | — | Dunér | 1881 | 3 C. | Dreyer, D. |
| 88 | II. | Hencke | 1860 | 14 C. 34 S. | Sm. |
| 89 | III. | Baxendell | 1857 | 69 S. | Sm. |
| 90 | II. | Pogson | 1860 | 4 C. | — |
| 91 | II. | Pogson | 1854 | 4 C. | — |
| 91*a* | — | Dunér | 1880 | — | D. W. |
| 91*b* | II. | Pickering | 1881 | 20 C. | Pickering |
| 91*c* | II. | Geelmuyden | 1876 | 18 C. 21 S. | H. Sm. W. |
| 92 | II. | At Bonn | 1856 | 10 C. 25 H. | H. Sm. W. |
| 93 | I. | Hind | 1848 | — | — |
| 93*a* | II. | Baxendell | 1880 | 11 C. | Baxendell |
| 94 | II. | Pogson | 1853 | 7 C. | D. |
| 95 | III. | W. Herschel | 1795 | — | Sm. |
| 95*a* | V. | Sawyer | 1881 | 12 S. | — |
| 96 | III. | Schmidt | 1869? | — | Sm. |
| 97 | I. | Fabricius | 1604 | — | — |
| 98 | IV. | Schmidt | 1866 | 16 S. | Sm. |
| 99 | IV. | Schmidt | 1866 | 44 S. | Sm. |
| 100 | II. | At Bonn | 1857 | 18 C. 13 H. | H. Sm. W. |
| 101 | II. | Baxendell | 1860 | 10 C. | — |
| 102 | II. | Quirling | 1865 | 6 C. | — |
| 103 | IV. | Schmidt | 1866 | 5 C. | Sm. |
| 104 | II. | Winnecke | 1860 | 9 C. | — |
| 105 | II. | Pigott | 1795 | 3 C. 79 S. | Sm. W. |
| 105*a* | IV. | Thome | 1872 | 1 U. | — |
| 106 | IV. | Goodricke | 1784 | — | Müller, Sm. W. |
| 107 | II.? | Baxendell | 1856 | 17 S. | — |
| 108 | IV.? | Schmidt | 1866 | 1 C. | Sm. |
| 109 | II.? | Schmidt | 1866 | 1 C. | Sm. |
| 110 | II. | At Bonn | 1856 | 1 C. | — |
| 111 | II. | Pogson | 1863 | 6 C. | Sf. |
| 112 | II. | Pogson | 1858 | 7 C. | D. |
| 113 | II. | Pogson | 1860 | 7 C. | — |
| 114 | II. | Pogson | 1852 | 14 C. 22 P. 17 H. 6 Z. | Sm. W. |
| 115 | I. | Anthelm | 1670 | — | — |
| 116 | II. | Hind | 1861 | 12 C. 26 H. 4 Z. | W. |
| 117 | II. | Kirch | 1686 | 11 C. 55 P. 26 H. 67 S. 4 Z. | Sm. W. |
| 118 | IV. | Pigott | 1784 | 16 S. | Sm. W. |
| 119 | II. | At Bonn | 1860 | 9 C. 15 P. | Sf. |
| 120 | II. | Hind | 1848 | 6 C. | D. |
| 121 | II. | Baxendell | 1863 | 10 C. | — |

TABLE I. — *Continued.*

| No. | H.P. | Name. | R. A. 1875. | | | Dec. 1875. | | Max. | Min. | Per. |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | h. | m. | s. | ° | ' | m. | m. | d. |
| 122 | — | R Sagittæ | 20 | 8 | 22 | +16 | 21.0 | 8.5 — 8.7 | 9.8 — 10.4 | 70.4 |
| 123 | — | R Delphini | | 8 | 53 | + 8 | 42.7 | 7.6 — 8.5 | 12.8 | 284.0 |
| 124 | 3547 | P Cygni | | 13 | 11 | +37 | 38.7 | 3 — 5 | <6 | — |
| 125 | — | U Cygni | | 15 | 44 | +47 | 30.1 | 7.8 ? | 9.8 ? | — |
| 126 | 3557 | R Cephei | | 34 | 29 | +88 | 45.2 | 5 ? | 10 ? | — |
| 126*a* | — | — Cygni | | 37 | 17 | +47 | 41.8 | 8 | 12 | 423. |
| 127 | — | S Delphini | | 37 | 19 | +16 | 38.4 | 8.4 — 8.6 | 10.4 — 11.1 | 275.6 |
| 128 | — | T Delphini | | 39 | 34 | +15 | 56.7 | 8.2 — 8.9 | <13 | 331.4 |
| 129 | — | U Capricorni | | 41 | 11 | —15 | 23.2 | 10.2 — 10.8 | <13 | 203.5 |
| 130 | 3654 | T Cygni | | 42 | 12 | +33 | 55.0 | 5.5 ? | 6 ? | — |
| 131 | — | T Aquarii | | 43 | 20 | — 5 | 45.3 | 6.7 — 7.0 | 12.4 — 12.7 | 203.2 |
| 132 | — | R Vulpeculæ | | 58 | 49 | +23 | 19.5 | 7.5 — 8.5 | 12.5 — 13.0 | 137.5 |
| 132*a* | — | Capricorni | 21 | 0 | 19 | —24 | 25.5 | 9½ | 14 | — |
| 132*b* | — | T Cephei | | 7 | 52 | +67 | 58.9 | 5.6 | 9.5 | 382 |
| 133 | — | T Capricorni | | 15 | 6 | —15 | 51.4 | 8.9 — 9.7 | <13 | 269.4 |
| 134 | — | S Cephei | | 36 | 45 | +78 | 3.6 | 7.4 — 8.5 | 11.5 | 485 |
| 134*a* | — | Nova Cygni | | 37 | 2 | +42 | 18 2 | | | — |
| 135 | 3845 | μ Cephei | | 39 | 41 | +58 | 12.4 | 4 ? | 5 ? | Irr. |
| 136 | — | T Pegasi | 22 | 2 | 48 | +11 | 55.7 | 8.8 — 9.3 | <12.5 | 367.5 |
| 137 | 3981 | δ Cephei | | 24 | 32 | +57 | 46.6 | 3.7 | 4.9 | 5.4 |
| 137*a* | — | Lacertæ | | 37 | 43 | +41 | 43.0 | 8.6 | <13.5 | 315. |
| 138 | — | S Aquarii | | 50 | 25 | —21 | 13.4 | 7.7 — 9.1 | <11.5 | 279.4 |
| 139 | 4078 | β Pegasi | | 57 | 45 | +27 | 24.2 | 2 2 | 2.7 | Irr. |
| 140 | — | R Pegasi | 23 | 0 | 22 | + 9 | 52.1 | 6.9 — 7.7 | 12 ? | 382.0 |
| 141 | — | S Pegasi | | 14 | 14 | + 8 | 14.2 | 7.6 | <12.2 | — |
| 142 | 4193 | R Aquarii | | 37 | 21 | —16 | 11.9 | 5.8 — 8.5 | 11 ? | 388.0 |
| 143 | 4234 | R Cassiopeiæ | | 52 | 4 | +50 | 41.5 | 4 8 — 6 8 | <12 | 425.9 |

information desired. It is thought best not to delay the publication of the present circular in order to obtain additional information, much of which must be procured from Europe ; but astronomers will confer a favor upon this Observatory by sending material which may be used next year to make the table for 1883 more complete. It is highly desirable that this information, as well as that respecting the observations of 1884, should reach this Observatory as early as February 1, 1885, in order that the proposed circular may be issued as early in the year as possible. Information received later, however, may be made serviceable in any circular which may afterwards be prepared.

The bibliography undertaken by Mr. Chandler, as above mentioned, will eventually furnish the means of preparing a catalogue of all the stars now known to be variable. The list in Table I. is from his provisional catalogue of known variables, which consists of Schönfeld's Second Catalogue,* with forty-eight additional stars whose variability seems certain.

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* Zweiter Catalog von veränderlichen Sternen, Mannheim, 1875.

TABLE I. — *Continued.*

| No. | Class. | Discoverer. | Date. | Obs. 1883. | Obs. 1880-82. |
|---|---|---|---|---|---|
| 122 | II.? | Baxendell | 1859 | 10 C. | Sm. |
| 123 | II. | Hencke | 1859 | 7 C. 24 H. | W. |
| 124 | I. | Janson | 1600 | — | — |
| 125 | II. | Knott | 1871 | 8 C. 10 P. | Bm. Sf. W. |
| 126 | II.? | Pogson | 1856 | 3 C. | Sf. |
| 127 | II. | Birmingham | 1881 | 8 C. | Bm. K. Sf. Sm. |
| 127*a* | II. | Baxendell | 1860 | 8 C. | Sm. |
| 128 | II. | Baxendell | 1863 | 7 C. | D. Sm. |
| 129 | II. | Pogson | 1858 | 8 C. | — |
| 130 | — | Schmidt | 1864 | — | — |
| 131 | II. | Goldschmidt | 1861 | 8 C. | Sm. W. |
| 132 | II. | At Bonn | 1858 | 15 C. | W. |
| 132*a* | — | Peters | 1867 | — | — |
| 132*b* | II.? | Ceraski | 1878 | 6 C. | H. Knott, Sm. |
| 133 | II. | Hind | 1854 | 11 C. | — |
| 134 | II. | Hencke | 1858 | 7 C. | Sf. W. |
| 134*a* | I. | Schmidt | 1876 | — | — |
| 135 | III.? | Hind | 1848 | — | D. |
| 136 | II. | Hind | 1863 | 6 C. 18 P. | Sm. |
| 137 | IV. | Goodricke | 1784 | — | Sm. W. |
| 137*a* | — | Deichmüller | 1883 | 11 C. | — |
| 138 | II. | Argelander | 1853 | 5 C. | — |
| 139 | III. | Schmidt | 1847 | — | Sm. |
| 140 | II. | Hind | 1848 | 6 C. | Sm. |
| 141 | II. | Marth | 1864? | 6 C. | — |
| 142 | II. | Harding | 1811 | 8 C. | Sm. |
| 143 | II. | Pogson | 1853 | 11 C. 26 P. | Sm. |

The first column of the left-hand page of Table I. gives a provisional number for designating the star. This number is taken from Schönfeld's Catalogue when the star occurs there; in other cases, a letter is added to the number. Other letters may be employed in effecting additional interpolations. The second column contains numbers from the catalogue of stars observed with the meridian photometer at the Harvard College Observatory, to be printed in Volume XIV. of the Annals of that institution. The letters H. P. (Harvard Photometry), prefixed to a number, will denote a reference to this catalogue. The following columns contain the right ascension and declination of the star for 1875, its magnitude at maximum and minimum, and its period in days.

The first column of the right-hand page repeats the number to be used for the provisional designation of the star. The second gives the class to which the star belongs, upon the system of classification employed in the Proceedings of the American Academy of Arts and Sciences, XVI. 257. Upon this system, Class I. includes temporary stars; Class II., stars undergoing large variations in periods of several months; Class III., irregularly variable stars undergoing but slight changes in brightness; Class IV., variable stars of short period, like *β Lyræ* or *δ Cephei;* Class V., Algol stars, or those which at regular intervals undergo sudden diminutions of light, lasting for but a few hours. The third column gives the name of the discoverer, and the fourth column the date. The fifth column gives the number of nights on which each star was observed in 1883 by the observers, whose initials are appended to the figures. These initials are placed in alphabetical order, and are explained below. The last column contains the names of other astronomers who are known to have observed the corresponding stars since 1880. Some of these names have been abbreviated as follows: Dunér, D.; Hartwig, H.; Safarik, Sf.; Schmidt, Sm.; Wilsing, W.

The initials in the last column but one of Table I. refer to the following series of observations: —

C. This series is carried on by Mr. S. C. Chandler, Jr., at the Harvard College Observatory. The telescope employed was made by Mr. Clacey. Its aperture is 6¼ inches, and the magnifying power employed is generally 45; sometimes, 125 or 200. The observations were begun in March, 1883, but their number has been greatly increased since October. The present plan contemplates two or three observations of each variable belonging to Class II. during every month, whenever it is sufficiently bright to be visible. The observations are made by Argelander's method. Estimates of magnitude are also made independently.

H. These observations are made by the Rev. J. Hagen, S. J., at Prairie du Chien, Wisconsin. After the middle of November, 1883, the observations were independently repeated by Mr. Zwack. The instrument is a telescope by Merz, three inches in aperture. The observations are made by the division into tenths of the interval between two comparison stars. A copy of all the observations has been received at the Harvard College Observatory, and is available for the discussion of the variations of any of the stars observed.

L. These observations were made by Mr. H. A. Lawrence, and will be mentioned below, under the heading U.

P. These observations are made by Mr. H. M. Parkhurst, at Brooklyn, N. Y., with a telescope made by Fitz, nine inches in aperture. The magnifying powers employed are 56 and 150. Many of the observations are made by Argelander's method, and the remainder with photometric apparatus devised by Mr. Parkhurst, in order to effect an optical diminution of the aperture, without diminishing the brightness of the field, until the disappearance of the star. The telescope being fixed, the pencil of rays is gradually intercepted and slightly deflected by a prism, the proportion of the light being determined by the time which elapses after the passage of the transit wire by the star. Both accuracy and facility of reduction are much increased by placing over the object-glass caps bounded by logarithmic curves. A copy of the observations has been received at the Harvard College Observatory, and is available for the discussion of the variations of any of the stars observed.

S. These observations are made by Mr. E. F. Sawyer, at Cambridgeport, Mass., by means of an opera-glass for the brighter stars, and of a field-glass for the others. It is to be noticed that the observations of the star 95 *b*, made by Mr. Sawyer on twelve nights, consist in the observation of twelve minima, each series usually including a large number of comparisons. Mr. Sawyer has sent the results of all his observations to the *Astronomische Nachrichten.*

U. These observations were made by Professor Winslow Upton, of Brown University, during an expedition to observe the total eclipse of the Sun which occurred on May 6, 1863. The observations were chiefly made on board the U. S. S. Hartford, but partly on Caroline Island, in the Pacific Ocean. No instruments except a field-glass were employed in the comparisons, which were made by the division into tenths of the interval between two comparison stars. Most of the observations were independently repeated by Mr. H. A. Lawrence. The stars observed were all south of —30° declination; no account has been received of any other observations of these southern stars during 1883.

Z. These observations were made by Mr. Zwack, and have already been mentioned under the heading H.

Although it is of course impossible to prepare a complete list of stars suspected of variability, as distinguished both from known variables and from stars about the magnitude of which observers have slightly differed, the attempt has been made in Table II. to provide a list of stars for the variability of which there is evidence enough to make them interesting objects. When the variability of any of these stars has been fully established, it will be very desirable to determine their maxima, minima, periods, and light curves. In observing these objects, the comparisons should be made either by Argelander's method or by some other of sufficient precision to decide the question of variability. The mere estimation of magnitudes cannot suffice for this purpose.

## TABLE II. — SUSPECTED VARIABLES.

| No. | H. P. | R. A. 1875. | | | Dec. 1875. | | Max. | Min. | Authority. |
|---|---|---|---|---|---|---|---|---|---|
| | | h. | m. | s. | ° | ′ | | | |
| 1 | 23 | 0 | 6 | 49 | +14 | 29.7 | 2.5 | 3.1 | Schwab |
| 5 | — | | 17 | 27 | —10 | 9.1 | 10 | — | Borelly |
| 9 | — | | 37 | 51 | + 6 | 36.9 | 9 | 12 | Hind |
| 25 | — | 1 | 15 | 0 | + 9 | 1.6 | 10 | Inv. | Tempel |
| 47 | — | | 47 | 45 | + 8 | 9.9 | 6.7 | 8 | Argelander |
| 49 | — | | 49 | 25 | —68 | 33.6 | 6.6 | 7.5 | Gould |
| 59 | — | 2 | 10 | 24 | +58 | 22.3 | 8.5 | 9.5 | Safarik |
| 73 | — | 3 | 37 | 37 | + 9 | 0.2 | 9½ | Inv. | Palisa |
| 75 | — | | 38 | 1 | +23 | 41 | — | — | Wolff |
| 81 | — | | 46 | 29 | + 7 | 24.1 | 6¾ | 8 | Gould |
| 87 | — | | 57 | 46 | +23 | 38.4 | 9.5 | 12 | Kreutz |
| 93 | — | 4 | 14 | 32 | +19 | 31.1 | 9.2 | 10.0 | Baxendell |
| 97 | — | | 32 | 28 | +13 | 28.5 | 9.5 | Inv. | Palisa |
| 109 | 867 | | 49 | 42 | —16 | 37.2 | 5.4 | 6.0 | Gould |
| 111 | 881 | | 53 | 57 | + 3 | 25.8 | 6 | 6¾ | Gould |
| 113 | 883 | | 54 | 7 | —12 | 43.4 | 4.8 | 5.7 | Gould |
| 139 | — | 5 | 23 | 49 | — 1 | 7.7 | 9 | — | Argelander |
| 143 | — | | 27 | 23 | +21 | 51.5 | 8½ | 11½ | Schmidt |
| 145 | 1018 | | 28 | 18 | +10 | 9.6 | 5.7 | 6.7 | Gould |
| 147 | 1021 | | 28 | 56 | — 6 | 5.5 | 5 | 6 | Falb & Gould |
| 161 | — | 6 | 11 | 14 | — 1 | 31.6 | 8 | 9½ | Copeland |
| 167 | — | | 59 | 22 | +23 | 5.9 | 9.0 | 12 | Safarik |
| 189 | — | 7 | 36 | 2 | —31 | 22.3 | 6.5 | 7.4 | Gould |
| 195 | — | | 43 | 52 | —40 | 20.6 | 6.5 | 7.2 | Gould |
| 201 | — | | 59 | 44 | +23 | 8.7 | 9.5 | — | Palisa |
| 205 | — | 8 | 2 | 26 | +19 | 48.3 | 9.7 | 14 | Peters |
| 209 | — | | 21 | 3 | + 9 | 0 | 9½ | — | Palisa |
| 227 | 1684 | 9 | 13 | 13 | —23 | 57 | 6 | 8½ | Schönfeld |
| 239 | — | | 27 | 25 | —56 | 29.0 | 3½ | 4½ | Gould |
| 251 | — | | 44 | 32 | +30 | 41.7 | 9 | Inv. | Schmidt |
| 259 | — | 10 | 1 | 27 | —51 | 34.8 | 6½ | 7½ | Gould |
| 269 | — | | 12 | 55 | + 7 | 49.8 | 9½ | — | Palisa |
| 271 | — | | 12 | 55 | —60 | 42.5 | 3.3 | 4.5 | Gould |
| 277 | — | | 21 | 55 | —73 | 23.7 | 4.2 | 5.1 | Gould |
| 293 | — | | 45 | 33 | —20 | 35.2 | 6 | 8 | Gould |
| 294 | — | | 47 | 2 | +14 | 22.9 | 9 | — | Peters |
| 311 | — | 12 | 7 | 31 | + 0 | 16.8 | 8 | 8.7 | Harrington |
| 337 | — | | 32 | 41 | +17 | 11.8 | 8.8 | 10.0 | Weiss |
| 339 | — | | 32 | 54 | +17 | 10.7 | — | — | Weiss |
| 345 | 2160 | | 37 | 2 | —13 | 10.4 | 5 | 7 | Schönfeld |
| 347 | 2164 | | 39 | 15 | +46 | 7.4 | 6 | — | Schmidt |
| 365 | 2293 | 13 | 28 | 2 | —12 | 35.1 | 5.7 | 6.3 | Schmidt |
| 373 | 2343 | | 43 | 27 | +16 | 25.1 | — | — | Schmidt |
| 375 | — | | 47 | 47 | +11 | 41.1 | 8½ | — | Hind |
| 381 | — | | 56 | 25 | — 1 | 46.6 | 8 | 9 | Copeland |
| 383 | — | | 58 | 15 | — 8 | 35.9 | 11 | — | Peters |
| 405 | — | 14 | 39 | 59 | —56 | 8.3 | 6 | 7 | Gould |
| 407 | 2475 | | 42 | 41 | + 6 | 28.9 | 6 | 8 | Hussey |
| 411 | — | | 43 | 42 | —76 | 9.0 | 5.5 | 6.2 | Gould |
| 421 | — | | 58 | 9 | —68 | 14.2 | 7.0 | 7.4 | Gould |
| 433 | — | 15 | 26 | 53 | —48 | 55 8 | 7 | 9½ | Gould |
| 437 | — | | 28 | 59 | —20 | 45.0 | — | — | Peters |
| 441 | — | | 30 | 47 | —15 | 45.5 | — | — | Peters |

TABLE II. — *Continued.*

| No. | H. P. | R. A. 1875. | | | Dec. 1875. | | Max. | Min. | Authority. |
|---|---|---|---|---|---|---|---|---|---|
| | | h. | m. | s. | ° | ′ | | | |
| 447 | — | 15 | 36 | 28 | —10 | 31.1 | 7.0 | 8.8 | Weiss |
| 449 | — | | 38 | 46 | —34 | 17.3 | 5½ | 6½ | Gould |
| 451 | — | | 39 | 14 | —20 | 44.3 | 11 | Inv. | Peters |
| 453 | — | | 43 | 23 | +28 | 40.0 | 11 | 12½ | Schmidt |
| 459 | — | 16 | 1 | 11 | —21 | 11.4 | 11 | <13 | Peters |
| 471 | — | | 22 | 22 | —19 | 14 | — | Inv. | Peters |
| 475 | — | | 30 | 47 | + 7 | 22.1 | 7 | 8 | Chandler |
| 483 | — | | 44 | 45 | — 5 | 57.6 | 8 | 11 | Birmingham |
| 509 | 3048 | 18 | 2 | 43 | +28 | 44 | 4½ | — | Schwab |
| 511 | — | | 9 | 19 | —34 | 8.8 | 6.2 | 7.4 | Gould |
| 513 | — | | 9 | 49 | +71 | 3.1 | 9 | — | Schmidt |
| 517 | — | | 27 | 58 | +36 | 53.9 | 7½ | 9 | Birmingham |
| 531 | — | | 53 | 32 | —37 | 8.3 | 10 | — | Schmidt |
| 547 | 3362 | 19 | 25 | 40 | +27 | 41.9 | 3.3 | 3.9 | Klein |
| 549 | — | | 27 | 9 | +17 | 28.5 | 6½ | 9½ | Nature |
| 555 | — | | 35 | 19 | +12 | 52.9 | 6½ | 9½ | Argelander |
| 557 | — | | 37 | 57 | +35 | 55.2 | 8½ | 10 | Argelander |
| 567 | — | 20 | 7 | 8 | —22 | 21.4 | 11 | — ? | Peters |
| 601 | — | 21 | 1 | 24 | —21 | 51.3 | 11½ | Inv. | Peters |
| 609 | — | | 12 | 42 | —50 | 27.6 | 6.1 | 7.3 | Gould |
| 615 | — | | 56 | 30 | —17 | 13.7 | 11 | 14? | Peters |
| 625 | 3977 | 22 | 23 | 57 | —26 | 42.7 | 5½ | 6.7 | Schmidt |
| 635 | — | 23 | 14 | 51 | +55 | 25.8 | 8.2 | 8.8 | Argelander |
| 651 | — | | 51 | 30 | — 9 | 39.4 | 9.7 | 14 ? | Peters |

The list given in Table II. is extracted from Mr. Chandler's unpublished catalogue of suspected variables, and comprises the objects in that catalogue the variability of which is suspected on reasonably good evidence. The first column contains the provisional numbers by which the corresponding stars are designated in Mr. Chandler's catalogue. The second column, as in Table I., gives the H. P. number. The remaining columns contain the right ascension and declination for 1875, the supposed magnitude at maximum and at minimum, and the authority for the suspicion of variability.

Accurate observations of these stars, or of other similar objects, are much to be desired. Information respecting the dates of observation, and results derived from the comparisons, which may be communicated by observers, will be published in the circular for 1885, whether they relate to 1884 or to previous years.

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